Grade 5

meap™
Michigan Educational Assessment Program

Item Descriptors

5th

8th

Revised 1/8/14

SCIENCE
FALL 2013

MICHIGAN STATE BOARD OF EDUCATION

STATEMENT OF ASSURANCE OF COMPLIANCE WITH FEDERAL LAW

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NOTE: For each item listed throughout this booklet, the first statement is the Michigan Science Curriculum Framework (MSCF) benchmark and the second statement is the descriptor for the item's stem or question. Note that some items only occur in certain forms as indicated by the form numbers in parenthesis after the item numbers (i.e., F1=Form 1, F2=Form 2, etc.).

Students were instructed to read the directions below silently as the test administrator read them aloud.

PART 1

DIRECTIONS:

In this part, you will answer multiple-choice science questions. Some questions will ask you to read a passage, table, or other science-related information. Use that information with what you know to answer the question.

You must mark all of your answers in Part 1 of your **Answer Document** with a No. 2 pencil. You may underline, circle, or write in this test booklet to help you, but nothing marked in this test booklet will be scored. No additional paper may be used.

Mark only one answer for each question. Completely fill in the corresponding circle on your **Answer Document**. If you erase an answer, be sure to erase completely. Remember that if you skip a question in the test booklet, you need to skip the answer space for that question on the **Answer Document**. If you are not sure of an answer, mark your **best** choice.

A sample question is provided for you below.

Sample Multiple-Choice Question:

Pill bugs can often be found underneath rocks and rotting logs. When exposed to light, they immediately try to find a dark place to hide. This reaction by the pill bugs is a result of

A migration.

B feeding behavior.

C energy requirements.

D changing environmental conditions.

For this sample question, the correct answer is **D**. Circle **D** is filled in for the sample question on your **Answer Document**.

Once you have reached the word **STOP** in your test booklet, do **NOT** go on to the next page. If you finish early, you may go back and check your work in Part 1 of the test **ONLY**. Check to make sure that you have answered every question. Do **NOT** look at any other part of the test.

NOTE: The directions for Part 2 are the same as the above instructions.

1 **L.OL.03.42:** Classify animals on the basis of observable physical characteristics (backbone, body coverings, limbs).

Given two organisms, identify a difference between the organisms that would help to classify them into two groups.

A correct, selected a physical characteristic that is different between the organisms

B selected a physical characteristic shared between the organisms

C selected a physical characteristic shared between the organisms

D selected a physical characteristic shared between the organisms

2 **(F1) L.OL.03.41:** Classify plants on the basis of observable physical characteristics (roots, leaves, stems, and flowers).

Group plants together based on given physical characteristics.

A incorrect, selected plants sharing only one of the three observable physical characteristics

B correct, selected plants sharing three observable physical characteristics

C incorrect, selected plants sharing only two of three observable physical characteristics

D incorrect, selected plants sharing only one of three observable physical characteristics

2 **(F2) L.OL.03.32:** Identify and compare structures in animals used for controlling body temperature, support, movement, food-getting, and protection (for example: fur, wings, teeth, scales).

Correctly compare the structures of two different animals and how they use these structures to control body temperature and get food.

A selected incorrect comparison of body coverings

B selected correct comparison of body coverings and food getting structures

C selected incorrect comparison of body coverings and food getting structures

D selected incorrect comparison of food getting structures

2 **(F3) L.OL.03.41:** Classify plants on the basis of observable physical characteristics (roots, leaves, stems, and flowers).

Recognize that scientists use physical characteristics to classify plants.

A incorrect, selected a list of two useful physical characteristics and one characteristic that would not help to classify plants

B incorrect, selected a list of two useful physical characteristics and one characteristic that would not help to classify plants

C incorrect, selected a list of two useful physical characteristics and one characteristic that would not help to classify plants

D correct, selected a list of three characteristics that can be used to classify plants

2 (F4) L.OL.02.22: Describe the life cycle of familiar flowering plants including the following stages: seed, plant, flower, and fruit.

Given illustrations of a common flowering plant, recognize a specified stage of plant growth.

A incorrect, selected a stage of plant growth other than specified

B incorrect, selected a stage of plant growth other than specified

C incorrect, selected a stage of plant growth other than specified

D correct, recognized the specified stage of plant growth

2 (F5) L.OL.04.15: Determine that plants require air, water, light, and a source of energy and building material for growth and repair.

Recognize when the supply of a basic need decreases, growth of a plant will also likely decrease.

A incorrect, selected a factor that is not limited

B incorrect, selected a factor that is not likely limited based on the given information

C correct, selected a limiting factor that would likely cause the decrease in growth

D incorrect, selected a factor that is not likely limited based on the given information

3 L.OL.02.14: Identify the needs of plants.

Identify the needs of plants for survival.

A incorrect, selected a list with two correct and one incorrect need for most plants

B incorrect, selected a list with one correct and two incorrect needs for most plants

C incorrect, selected a list with one correct and two incorrect needs for most plants

D correct, selected a list of plants' needs

4 S.IP.04.16: Construct simple charts and graphs from data and observations.

Recognize the appropriate display for data during an investigation.

A selected incorrect display for recording the growth of a plant

B selected incorrect display for recording the growth of a plant

C correct, selected a display that can accurately organize data for recording growth of the plant

D selected incorrect display for organizing the growth of a plant

5 (F1) S.IA.04.11: Summarize information from charts and graphs to answer scientific questions.

Using data provided in a chart regarding organism growth in relation to the presence or absence of a treatment variable, draw the correct conclusion on the effects of the treatment variable.

A selected a conclusion about organism growth not reflected by the variability of the growth data

B selected a conclusion about organism growth for which data were not provided

C correct, selected the conclusion indicating how treatment variable affects organism growth

D selected a conclusion about organism growth not reflected by the variability of the growth data

5 (F2) S.IA.04.13: Communicate and present findings of observations and investigations.

Given a magnet investigation, describe the best results and method to display these results.

A correct, described a presentation and results that would be clear to a class

B incorrect, selected a display of off-topic magnetic concepts

C incorrect, selected a display of investigation procedures not results

D incorrect, selected inappropriate results of the given investigation

5 (F3) S.IA.04.13: Communicate and present findings of observations and investigations.

Given four methods, identify the tool and activity a researcher would use to best share his research findings.

A correctly selected the tool and activity that provides the research findings to an audience

B selected a tool and activity that only shows how research data were gathered

C selected a tool and activity that only shows how the researcher carried out a data gathering trial

D selected a tool and activity that only shows how the researcher carried out data calculations

5 (F4) S.IA.04.13: Communicate and present findings of observations and investigations.

Recognize the most likely conclusion, from the list provided, based on the data presented in a table.

A incorrect, the conclusion has no basis in the data provided

B incorrect, the conclusion has no basis in the data provided

C incorrect, the conclusion has no basis in the data provided

D correctly recognized the conclusion that is supported by the data provided in the table

5 **(F5) S.IA.04.11:** Summarize information from charts and graphs to answer scientific questions.

Select the correct conclusion based on the data presented in a bar graph.

A selected a conclusion not supported by the data provided

B selected the correct conclusion based on data presented in the graph

C selected a conclusion not supported by the data provided

D selected a conclusion not supported by the data provided

6 **P.PM.04.34:** Demonstrate that magnetic objects are affected by the strength of the magnet and the distance away from the magnet.

Given pictures of two magnets indicating each magnet's relative strength, identify the best magnet for a specified task.

A selected incorrect magnet though appropriate distance for demonstration of the magnet's force

B selected incorrect magnet and the wrong distance for demonstration of the magnet's force

C correctly selected the magnet and the appropriate distance for demonstration of the magnet's force

D selected the correct magnet, however the wrong distance for demonstration of the magnet's force

7 **(F1) P.PM.02.41:** Recognize that some objects are composed of a single substance (water, sugar, salt) and others are composed of more than one substance (salt and pepper, mixed dry beans).

Given two groups of substances, recognize they are organized by single substances and mixtures.

A incorrectly selected differences in phases of matter

B incorrectly selected differences in origin of substances

C correctly selected differences in composition of substances

D incorrectly selected differences in temperature of substances

7 **(F2) P.PM.02.13:** Measure the length of objects using rulers (centimeters) and meter sticks (meters).

Identify a measurement that would likely be made with a meter stick.

A selected incorrect measurement

B selected a measurement made with a balance

C correct, selected the length of a specified object

D incorrect, selected correct measurement but incorrect scale

7 (F3) P.PM.02.13: Measure the length of objects using rulers (centimeters) and meter sticks (meters).

Recognize the appropriate tools used to measure the length of two objects.

A selected incorrect tools to measure length for both objects

B correct, selected a ruler to measure the length of the smaller object and a meter stick to measure the length of the larger object

C incorrect, selected tools to measure mass and time

D incorrect, selected tools to measure mass and time

7 (F4) P.PM.04.53: Identify objects that are good conductors or poor conductors of heat and electricity.

Recognize the reason why using a tool made of a specified material is safest for use in the described situation.

A selected an incorrect material property and the property does not provide for the safety use in the situation

B selected a material property that does not provide for the safety use in the situation

C correctly recognized the basis for material providing safety

D selected an incorrect material property and the property does not provide for the safety use in the situation

7 (F5) P.PM.04.16: Measure the weight (spring scale) and mass (balances in grams or kilograms) of objects.

Use the appropriate measurement unit to record data about a specified characteristic of a substance.

A selected the wrong measurement unit

B correctly identified the measurement unit for the characteristic of the substance

C selected the wrong measurement unit

D selected the wrong measurement unit

8 P.PM.03.52: Explain how we need light to see objects: light from a source reflects off objects and enters our eyes.

Understand the path light travels from source, object, and eyes in order to see an object.

A selected an incomplete light path that does not enable vision

B selected an incorrect and incomplete light path that does not enable vision

C selected an incorrect light path that does not enable vision

D selected the correct light path that does enable vision

9 P.PM.02.15: Compare the weight of objects using balances.

Compare the relative masses of similar objects using the provided measures.

A selected an incorrect comparison statement

B selected an incorrect comparison statement

C selected an incorrect comparison statement

D correctly recognized the relative comparison of the mass measures between the two objects

10 (F1) P.PM.04.33: Demonstrate magnetic field by observing the patterns formed with iron filings using a variety of magnets.

Based on investigation information, recognize a magnetic field can be shown when iron filings are spread around a magnet.

A incorrectly selected a characteristic of the magnet not supported by the provided information

B incorrectly selected a characteristic of the magnet not supported by the provided information

C correct, selected the pattern of the iron filings that shows the magnetic field of a magnet

D incorrect, selected an inaccurate characteristic of magnets

10 (F2) P.PM.02.14: Measure the volume of liquids using common measuring tools (graduated measuring cups, measuring spoons, graduated cylinders, and beakers).

Select the correct measurement tool to use for a specified measurement situation.

A selected the wrong measurement tool

B selected the wrong measurement tool

C selected the wrong measurement tool

D selected the correct measurement tool

10 (F3) P.PM.04.17: Measure volumes of liquids in milliliters and liters.

Recognized the volume of a milliliter.

A underestimated the volume of the container

B underestimated the volume of the container

C correctly estimated the volume of the container

D overestimated the volume of the container

10 (F4) P.PM.03.51: Demonstrate how some materials are heated more than others by light that shines on them.

Predict the most likely outcome of an investigation, based on the effect of sunlight on different color objects.

A selected a prediction that implies no understanding regarding the effects of sunlight on different color objects

B correctly, identified the likely outcome from the effect of incident sunlight on different color objects

C selected a prediction that implies no understanding regarding the effects of sunlight on different color objects

D selected a prediction that implies no understanding regarding the effects of sunlight on different color objects

10 (F5) P.PM.02.14: Measure the volume of liquids using common measuring tools (graduated measuring cups, measuring spoons, graduated cylinders, and beakers).

Identify the measuring units provided by the specified measurement tool.

A selected incorrect units of measure provided by the measurement tool

B selected incorrect units of measure provided by the measurement tool

C selected incorrect units of measure provided by the measurement tool

D correct, selected the units of measure provided by the measurement tool

11 P.PM.02.12: Describe objects and substances according to their properties (color, size, shape, texture, hardness, liquid or solid, sinking or floating).

Recognize the property of a substance that makes it useful for a specified purpose.

A selected a property of the substance that is not the basis for the substance's use for the specified purpose

B selected a property that the substance does not have

C selected the property of the substance which makes it useful for the specified purpose

D selected a property that the substance does not necessarily have

12 P.CM.04.11: Explain how matter can change from one state (liquid, solid, gas) to another by heating and cooling.

Understand gain and loss of energy as basis for change in state of matter.

A selected an incorrect mixture concept to use as basis for change in state of matter

B selected an incorrect concept to use as a basis for change in state of matter

C selected an incorrect energy condition for the substance to change to the specified state of matter

D recognized the basis for the substance's specified change in state of matter

13 (F1) P.FM.03.42: Identify changes in motion (change direction, speeding up, slowing down).

Based on the description, recognize the correct change in direction and correct change in speed of a specified object relative to the group of remaining objects

A selected an incorrect description about the object's change in speed and direction relative to the group of objects

B selected correct description of the specified object's change in speed and direction relative to the group of objects

C selected an incorrect description about the object's change in speed and direction relative to the group of objects

D selected an incorrect description about the object's change in speed and direction relative to the group of objects

13 (F2) P.FM.03.37: Demonstrate how the change in motion of an object is related to the strength of the force acting upon the object and to the mass of the object.

Recognize the amount of force required to move objects.

A selected an insufficient amount of force to move the object

B selected an insufficient amount of force to move the object

C correctly recognizes the amount of force needed to move the object

D selected an insufficient amount of force to move the object

13 (F3) P.FM.03.41: Describe the motion of objects in terms of direction.

Given descriptions of four paths of motion, correctly identify the direction of the shortest path from one location to another.

A selected path of motion that is not the shortest

B selected the longest path of motion

C correct, selected shortest path of motion

D selected path of motion that is not the shortest

13 (F4) P.FM.03.22: Identify the force that pulls objects towards the Earth.

Identify the force of gravity and describe how gravity causes objects on Earth to fall to the ground.

A selected an incorrect source of force but provided a correct description of the direction of the force

B selected an incorrect source of the force and description of the direction of the force

C correct, identified the correct force and description of the direction of the force

D incorrect, selected the correct force but provided an incorrect description of the direction of the force

13 (F5) P.FM.03.43: Relate the speed of an object to the distance it travels in a standard amount of time.

An object moved a given distance in a specified time; calculate the object's speed.

A selected an incorrect rate of speed

B selected an incorrect rate of speed

C selected an incorrect rate of speed

D correctly calculated the object's speed

14 S.IA.04.12: Share ideas about science through purposeful conversation in collaborative groups.

Given four different methods by which to share and learn the results from all groups who completed the same lab task, identify the best method for communication.

A selected a communication method the does not share all groups' lab results with each lab group

B correct, selected the best communication method where all groups share their own lab results with every other group

C selected a communication method that only shares some of the groups' results with other groups

D selected a communication method where only one group presents its lab results to all other groups

15 E.SE.03.22: Identify and describe natural causes of change in the Earth's surface (erosion, glaciers, volcanoes, landslides, and earthquakes).

Recognize a reasonable explanation regrading the movement and relocation of Earth materials and biological debris across land surface in a short time.

A selected an incorrect explanation which proposed an insufficient force to move the materials

B selected an incorrect explanation which proposed an unreal source and process for the materials and the material's movement

C selected an explanation that would move the materials, but the movement of the material would take much longer than one week

D correctly selected most reasonable explanation, recognizing the likely forces sufficient to move the specified materials

16 (F1) E.FE.02.11: Identify water sources (wells, springs, lakes, rivers, oceans).

Given a natural event, describe the water source that would be least affected by the natural event based on the water's location.

A correct, selected a water source that is deep below the surface of Earth that would be least affected by the natural event

B incorrect, selected a water source that is on the surface of Earth that would be affected by the natural event

C incorrect, selected a water source that is on the surface of Earth that would be affected by the natural event

D incorrect, selected a water source that is on the surface of Earth that would be affected by the natural event

16 (F2) E.FE.02.11: Identify water sources (wells, springs, lakes, rivers, oceans).

Given a scenario, identify the water source as a spring.

A selected incorrect underground water source

B selected an incorrect surface water source

C selected an incorrect surface water source

D correctly described a shallow water source found beneath the surface of Earth within ground composite

16 (F3) E.FE.02.12: Identify household uses of water (drinking, cleaning, food preparation).

Recognize and prioritize the use of household water.

A selected one correct and one incorrect priority use for household water

B recognized the two high priority uses for household water

C selected one correct and one incorrect priority use for household water

D selected one correct and one incorrect priority use for household water

16 (F4) E.FE.02.14: Describe the properties of water as a solid (hard, visible, frozen, cold) and recognize ice, snow, and hail as water in its solid state.

Based on the data provided, select the period having the most time where water occurred in a specified state of matter.

A selected a category having more time with water in states of matter other than the specified state

B selected a category having less time with water in the specified state of matter than another category

C selected the correct category having most time with water in the specified state of matter

D selected a category having more time with water in states of matter other than the specified state

16 (F5) E.FE.02.14: Describe the properties of water as a solid (hard, visible, frozen, cold) and recognize ice, snow, and hail as water in its solid state.

Given a substance and its current state of matter, identify characteristics of the substance.

A correctly identified three characteristics of the substance in its current state of matter

B incorrectly selected two of three characteristics for the substance in its current state of matter

C incorrectly selected two of three characteristics for the substance in its current state of matter

D incorrectly selected two of three characteristics for the substance in its current state of matter

17 E.SE.03.31: Identify Earth materials used to construct some common objects (bricks, buildings, roads, glass).

Recognize how a specified common Earth material is used in construction.

A selected an incorrect example how the specified Earth material is used for construction

B correctly recognized how the specified Earth material is used for construction

C selected an incorrect example how the specified Earth material is used for construction

D selected an incorrect example how the specified Earth material is used for construction

18 E.ES.03.41: Identify natural resources (metals, fuels, fresh water, fertile soil, and forests).

Distinguish natural resources from processed resources.

A incorrectly recognized the natural resource as processed and the processed resource as natural

B correctly recognized the natural resource and the processed resource

C correctly recognized the natural resource but also recognized the processed resource as natural

D incorrectly recognized the natural resource as a processed resource, but did recognize the processed resource

19 (F1) E.ST.04.25: Describe the apparent movement of the sun and moon across the sky through day/night and the seasons.

Explain why the position of the Sun changes during the seasons in the Northern Hemisphere.

A correctly selected a characteristic of Earth that influences the seasonal appearance of the Sun in the sky

B selected incorrect characteristic of Earth and its relationship to the Sun as the cause

C incorrect, selected the cause of night and day on Earth

D incorrect, selected a description of a year on Earth

19 (F2) E.ST.04.24: Explain how the visible shape of the moon follows a predictable cycle which takes approximately one month.

Recognize the basis for the change in appearance of the moon across the monthly lunar cycle.

A recognized the correct basis for the change in the moon's appearance

B selected an incorrect fact as basis for the moon's appearance change

C selected an incorrect fact as basis for the moon's appearance change

D selected an incorrect fact as basis for the moon's appearance change

19 (F3) E.ST.04.32: Compare and contrast life forms found in fossils and organisms that exist today.

Recognize the limits of fossil evidence.

A drew an incorrect conclusion, a conclusion unfounded by the fossil evidence

B drew the correct conclusion as pertaining to the fossil evidence in the rock

C drew an incorrect conclusion, a conclusion not supported by the type of rock having fossil evidence

D drew an incorrect conclusion, a conclusion unfounded by the fossil evidence

19 (F4) E.ST.04.21: Describe the orbit of the Earth around the sun as it defines a year.

Understand the definition of an Earth year.

A selected an incorrect number of days for an Earth year

B selected an incorrect number of days for an Earth year

C selected the correct number of days in an Earth year

D selected an incorrect number of days for an Earth year

19 (F5) E.ST.04.31: Explain how fossils provide evidence of the history of the Earth.

Use geologic information presented in an illustrated rock-layer formation to support a conclusion based on the information.

A drew correct conclusion about illustrated objects' relative age

B drew a conclusion about the objects' environment though no data on environment were provided

C drew a conclusion related to a geologic event though no information was provided regarding any such event

D drew a conclusion related to a geologic event though no information was provided regarding any such event

20 **E.ES.03.43:** Describe ways humans are protecting, extending, and restoring resources (recycle, reuse, reduce, renewal).

Describe an action that would renew a natural resource.

A described an example of reusing resources

B described an example of reducing consumption of resources

C described an example of recycling a product made from petroleum

D correctly described an action that would renew a natural resource

21 **S.IA.04.14:** Develop research strategies and skills for information gathering and problem solving.

Given a mixture of two common, different substances of approximately the same grain size, identify the correct procedure to separate the two substances of the mixture

A selected an incorrect procedure and tools to separate the two substances which relied on non-existent substance properties

B selected an incorrect procedure and tools to separate the two substances since the tools were inadequate for substance separation

C selected the correct procedure and tools to separate the two substances based on different properties between substances

D selected the correct procedure and tools but did not recognize the difference in properties of the substances, so the results anticipated will not be obtained

22 **S.IP.04.14:** Manipulate simple tools that aid observation and data collection (for example: hand lens, balance, ruler, meter stick, measuring cup, thermometer, spring scale, stop watch/timer, graduated cylinder/beaker).

Use the appropriate scientific tool for a specified investigation task.

A selected an inappropriate tool for the specified investigation task

B selected an inappropriate tool for the specified investigation task

C correctly selected the appropriate scientific tool for the specified investigation task

D selected an inappropriate tool for the specified investigation task

23 **S.RS.04.16:** Identify technology used in everyday life.

Describe how technology could be used in everyday life of a student.

A incorrect, selected an activity that would not likely require technology

B incorrect, selected an activity that would not likely require technology

C correct, selected an activity describing the use of technology

D incorrect, selected an activity that would not likely require technology

24 (F1) S.IP.04.12: Generate questions based on observations.

Identify an appropriate question that could be asked about a given investigation.

A incorrect, selected a question that is not likely being investigated

B incorrect, selected a question that is not likely being investigated

C correct, selected a question that is likely being investigated using the setup and information provided

D incorrect, selected a question that is not likely being investigated

24 (F2) S.IP.04.12: Generate questions based on observations.

Identify the research question that would best apply to a specified research topic.

A selected a question that is off topic regarding the specified research topic

B selected a question that is off topic regarding the specified research topic

C selected a question that is off topic regarding the specified research topic

D correct, identified the question that would lead to a relevant, testable hypothesis regarding the specified research topic

24 (F3) S.IP.04.15: Make accurate measurements with appropriate units (millimeters, centimeters, meters, milliliters, liters, Celsius, grams, seconds, minutes) for the measurement tool.

Recognize the scientific tool needed to accurately measure and obtain the data required to carry out a specified task.

A selected a tool that is not useful for all three measurements

B correctly selected the tool sufficient to accurately measure and obtain the three required measurements

C selected a tool that is not useful for all three measurements

D selected a tool that is not useful for any of the three measurements

24 (F4) S.IP.04.12: Generate questions based on observations.

Identify the research question associated with a described observation scenario.

A selected a research question for which variable manipulation did not occur

B correctly identified the research question based on the observation of outcomes after systematic manipulation of variables

C selected a research question for which variable manipulation did not occur

D selected a research question for which variable manipulation did not occur

24 (F5) S.IP.04.13: Plan and conduct simple and fair investigations.

Recognize the necessary step and sequence of steps to test an investigation's intent (hypothesis).

A selected a step that would not test the investigation's intent

B selected a step that is not relevant to the investigation's intent

C correctly selected the step that would test the investigation's intent with empirical data

D selected a step that would gather opinion and not test the investigation's intent

25 S.RS.04.18: Describe the effect humans and other organisms have on the balance of the natural world.

Recognize a negative consequence of human activity with a specified environment.

A correctly identified a negative consequence of the described human activity in a specified environment

B selected a consequence that does not occur due to the human activity

C selected a consequence that does not occur due to the human activity

D selected a positive consequence that would occur due to the human activity

26 S.RS.04.15: Use evidence when communicating scientific ideas.

Given information about two objects, students compare the evidence of energy transfer and determine which evidence best supports the energy transfer.

A incorrectly selected some evidence that does not support the energy transfer

B correct, selected evidence that supports the type of energy transfer specified

C incorrectly selected two observations that do not provide evidence of energy transfer

D incorrectly selected some evidence that does not support the energy transfer

27 E.FE.02.13: Describe the properties of water as a liquid (visible, flowing, shape of container) and recognize rain, dew, and fog as water in its liquid state.

Recognize the name for liquid water that occurs under the described weather conditions.

A correctly selected the name for liquid water that forms under the described conditions

B selected a name for solid water

C selected the name for a water cycle process

D selected the name for a water cycle process

28 (F1) E.ES.03.42: Classify renewable (fresh water, fertile soil, forests) and non-renewable (fuels, metals) resources.

Distinguish among example of renewable and non-renewable natural resources.

A correctly recognized which two resources were misclassified

B incorrectly selected resources that were properly classified

C incorrectly selected resources that were properly classified

D incorrectly selected resources that were properly classified

28 (F2) E.ES.03.44: Recognize that paper, metal, glass, and some plastics can be recycled.

Recognize how three common materials are similar because they can be recycled.

A correctly described a similarity as all materials can be recycled

B incorrectly described the materials as having similar functions

C incorrectly described the materials as having similar functions

D incorrectly described the materials as being made from the same resources

28 (F3) E.ES.03.44: Recognize that paper, metal, glass, and some plastics can be recycled.

From the list of four human conservation behaviors, identify which behavior is a recycling activity.

A selected a reuse conservation behavior

B selected a reuse conservation behavior

C selected a reuse conservation behavior

D correct, selected a behavior that recycles a resource for a yet-to-be-determined later use

28 (F4) E.ES.03.51: Describe ways humans are dependent on the natural environment (forests, water, clean air, Earth materials) and constructed environments (homes, neighborhoods, shopping malls, factories, and industry).

Given a list of four pairs of natural resource materials, identify the pair of resources most likely used as materials to build a specified public infrastructure.

A selected a pair of natural resource materials where only one is readily used to build the specified infrastructure

B selected a pair of natural resource materials that historically were used to build the specified infrastructure, but are no longer used for this purpose

C selected a pair of natural resource materials where only one material was used in prior years, but is no longer used to build the specified infrastructure, the other material has no use in construction of the infrastructure

D correct, selected the pair of natural resource materials that are readily used to build the specified infrastructure

28 (F5) E.ES.03.52: Describe helpful or harmful effects of humans on the environment (garbage, habitat destruction, land management, renewable, and non-renewable resources).

Given a scenario of humans changing an environment, identify and explain a likely result of the change.

A correct, identified and explained a likely result of the environmental change

B incorrectly identified a result and provided an unlikely explanation

C incorrectly identified a result but provided a logical explanation

D incorrectly identified a result and provided an unlikely explanation

29 E.FE.02.21: Describe how rain collects on the surface of the Earth and flows downhill into bodies of water (streams, rivers, lakes, oceans) or into the ground.

Understand Earth's water flow processes.

A selected an incorrect tenet regarding water flow processes

B selected an incorrect tenet regarding water flow processes

C selected an incorrect tenet regarding water flow processes

D correctly recognized an essential tenet of water flow process

30 E.ST.04.12: Compare and contrast the characteristics of the sun, moon and Earth, including relative distances and abilities to support life.

Recognize similarities and differences between the Earth and the moon.

A incorrectly selected a difference between the Earth and the moon

B selected a classification of celestial objects that is incorrect for both the Earth and the moon

C incorrectly selected a difference between the Earth and the moon

D correctly recognized a similarity for the Earth and the moon

31 (F1) E.SE.02.21: Describe the major landforms of the surface of the Earth (mountains, plains, plateaus, valleys, hills).

Recognize features that distinguish types of Earth's surface landforms.

A correctly identified one surface landform having the specified feature but incorrectly selected another surface landform

B correctly identified the surface landform types having the specified feature

C correctly identified one surface landform having the specified feature but incorrectly selected another surface landform

D correctly identified one surface landform having the specified feature but incorrectly selected another surface landform

31 (F2) E.SE.03.13: Recognize and describe different types of Earth materials (mineral, rock, clay, boulder, gravel, sand, soil, water, and air).

Distinguish among and identify types of Earth materials based on a specified description.

A correctly identified the described Earth material

B incorrectly identified the described Earth material

C incorrectly identified the described Earth material

D incorrectly identified the described Earth material

31 (F3) E.SE.03.14: Recognize that rocks are made up of minerals.

Recognize the characteristic that universally applies to rocks

A selected an untrue statement since there is no difference in this feature between the rock and its components

B selected a statement about rock characteristics and its component's characteristics that is not true

C selected the correct characteristic regarding rock composition

D selected a statement that incorrectly reverses the scale of a rock and its components

31 (F4) E.SE.03.32: Describe how materials taken from the Earth can be used as fuels for heating and transportation.

Recognize three types of fuel that can be mined from below Earth's surface.

A incorrect, selected a list with only one fuel that is below Earth's surface

B incorrect, selected a list with only one fuel that is below Earth's surface

C correct, selected a list with three fuels that can be mined from below Earth's surface

D incorrect, selected a list with only two fuels that are below Earth's surface

31 (F5) E.SE.02.21: Describe the major landforms of the surface of the Earth (mountains, plains, plateaus, valleys, hills).

Recognize types of landforms based on description.

A selected an incorrect landform for the description

B selected an incorrect landform for the description

C recognized the correct type of landform

D selected an incorrect landform for the description

32 E.ST.04.23: Describe the motion of the moon around the Earth.

Using the relationship of the moon's orbit and its rotation, explain why same the side of the moon is observed on Earth.

A selected an incorrect description of the relative rotation speed of the moon and Earth

B selected an incorrect description of Earth's and the moon's time to complete one orbit

C selected an incorrect description of the moon's rotation and revolution

D correct, selected an accurate description of the moon's rotation and revolution

33 (F1) S.RS.04.11: Demonstrate scientific concepts through various illustrations, performances, models, exhibits, and activities.

Recognize a concept about the Sun, the moon and Earth from a model.

A selected a concept that is not shown with the given model

B selected a concept that is not shown with the given model

C correct, selected a concept that is shown in the model

D selected a concept that is not shown with the given model

33 (F2) S.RS.04.11: Demonstrate scientific concepts through various illustrations, performances, models, exhibits, and activities.

Given an illustration using scientific measurement tools and a liquid, recognize two properties of a liquid.

A incorrectly selected one property but correctly recognized the other property of the liquid

B incorrectly selected two properties of a liquid

C correctly recognized the two properties of a liquid

D correctly recognized one property but incorrectly selected the other property of the liquid

33 (F3) S.RS.04.14: Use data/samples as evidence to separate fact from opinion.

Given a described lab exercise and a table of data based on the exercise, recognize the best source of evidence that supports the conclusion from the lab work.

A correct, recognized the best source of evidence to support the conclusion of the lab project

B selected a process from the lab exercise that is unrelated to the conclusion of the lab project

C selected a step in the scientific process which, if it alone supported the conclusion, would make the lab project unnecessary

D incorrectly indicated that a majority of opinion offsets the valid empirical evidence obtained from the project

33 (F4) S.RS.04.17: Identify current problems that may be solved through the use of technology.

From the four options, select the best technological application to address the specified problem.

A selected a technology that does not satisfy the specified problem

B selected a technology that does not satisfy the specified problem

C selected a technology that does not satisfy the specified problem

D correct, selected a valid and reliable technology that addresses and eliminates the specified problem issue

33 (F5) S.RS.04.11: Demonstrate scientific concepts through various illustrations, performances, models, exhibits, and activities.

Given a list of four different methods of presentation to a group, select the best practice to demonstrate a specified model of planetary rotation.

A selected a practice that only presents an audio description of planetary motion

B selected a practice that only represents a two-dimensional illustration of planetary motion

C correct, recognized the best practice, which provides a three-dimensional model of planetary motion

D selected a presentation that does not address the subject of interest

34 S.IA.04.15: Compare and contrast sets of data from multiple trials of a science investigation to explain reasons for differences.

Interpret data from an investigation and describe a reasonable explanation for the results of the investigation.

A incorrect, selected an explanation not supported by the data

B incorrect, selected an unlikely explanation of the results

C incorrect, selected an unlikely explanation of the results

D correct, selected a reasonable explanation and is supported by the data

35 P.FM.03.36: Relate a change in motion of an object to the force that caused the change of motion.

Identify the force which caused the motion of an object in a specified situation.

A selected an incorrect force

B selected an incorrect force

C selected an incorrect force

D correctly selected the force that would cause the motion of the object

36 (F1) P.FM.03.35: Describe how a push or a pull is a force.

Given six items, each made of a common substance, select the pair of objects attracted to a magnet.

A selected a pair of objects where neither is attracted to a magnet

B selected a pair of objects where only one is attracted to a magnet

C correct, selected the pair of objects where each is attracted to a magnet

D selected a pair of objects where neither is attracted to a magnet

36 (F2) P.FM.03.22: Identify the force that pulls objects towards the Earth.

Describe how a noncontact force moves a falling object toward Earth.

A selected an incorrect description of how the noncontact force moves a falling object

B selected the correct description how the noncontact force acts on an object to cause it to fall to Earth

C selected an incorrect description of how the noncontact force moves a falling object

D selected an incorrect description of how the noncontact force moves a falling object

36 (F3) P.FM.03.37: Demonstrate how the change in motion of an object is related to the strength of the force acting upon the object and to the mass of the object.

Recognize the effect of a constant force on an object while an changing opposing force is also acting upon the object.

A selected the opposite effect of the constant force in regard to the opposing force

B correct, recognized the effect of the constant force on the object as the opposing force changed

C incorrectly selected a concept that another constant force on the object will change due to the application of the specified constant force

D incorrectly selected a concept that the application of the specified force would eliminate another constant force on the object

36 (F4) P.FM.03.43: Relate the speed of an object to the distance it travels in a standard amount of time.

Using the distance and time data provided, determine which participant had the fastest speed.

A selected a slower participant

B selected a slower participant

C recognized the participant that traveled the fastest

D selected a slower participant

36 (F5) P.FM.03.41: Describe the motion of objects in terms of direction.

Given an illustration of students in motion, identify the correct description of the students' location and/or motion.

A incorrect; described one student's motion correctly and one student's motion incorrectly

B correctly described one student's location and one student's motion

C incorrect; described one student's motion correctly and one student's motion incorrectly

D incorrect; described one student's motion correctly and one student's location incorrectly

37 P.FM.03.38: Demonstrate when an object does not move in response to a force, it is because another force is acting on it.

Recognize balanced forces will cause an object at rest to remain at rest.

A selected an inaccurate description of the given forces

B selected a description of forces that would cause the object to move

C selected a description of forces that would cause the object to move

D correct, selected a description of balanced forces

38 (F1) P.EN.03.11: Identify light and sound as forms of energy.

Given a scenario, describe evidence that sound can cause objects to vibrate.

A correctly described evidence that sound is a form of energy

B incorrect, selected evidence that sound cannot cause a change

C incorrect, selected an unlikely observation as evidence

D incorrect, selected an unlikely observation as evidence

38 (F2) P.EN.04.51: Demonstrate how electrical energy is transferred and changed through the use of a simple circuit.

Identify the correct order of energy flow to power a device.

A incorrect, selected a pathway that does not provide an initial flow of energy from a power source or a return to the power source

B incorrect, selected a pathway that does not have a conductor from the power source or a return to the power source

C correct, selected a pathway that orders energy transfer from power source to conductor to device and a return to the power source

D incorrect, selected all energy flowing from a device and power source to the conductors

38 (F3) P.EN.03.22: Observe what happens to light when it travels from air to water (a straw half in the water and half in the air looks bent).

Understand why objects, reflecting light to the eye through water, appear different compared to the same object reflecting the light to the eye not through water.

A selected the wrong effect regarding light transmission from the object

B correctly recognized that different media (e.g., water) bends the path of light as it transmits through the media to the eye

C selected the wrong effect regarding light transmission from the object

D selected the wrong effect regarding light transmission from the object

38 (F4) P.EN.03.32: Distinguish the effect of fast or slow vibrations as pitch.

Understand the relationship between speed in vibrations to pitch.

A correctly identified the sound of the pitch in relation to the substance's vibrations

B incorrectly identified the sound quality which is not related to the substance's vibrations

C incorrectly identified the sound of the pitch

D incorrectly identified the sound of the pitch

38 (F5) P.EN.04.41: Demonstrate how temperature can be increased in a substance by adding energy.

Using data provided, draw a conclusion about the effects of energy applied in a specified investigation.

A drew a conclusion that can not be substantiated by the investigation

B drew a conclusion that is not found in the provided results data

C drew a conclusion that contradicts the data from the investigation

D drew the correct conclusion about application of variable amounts of energy to the differing conditions of the investigation

39 P.EN.03.21: Demonstrate that light travels in a straight path and that shadows are made by placing an object in a path of light.

Understand how shadows occur.

A selected an incorrect statement indicating that shadows are associated with light frequency change

B selected an incorrect statement about light transmission as necessary for shadows to occur

C correct, recognized how shadows occur regarding light transmission

D selected an incorrect statement about the path of light necessary for shadows to occur

40 P.EN.04.42: Describe heat as the energy produced when substances burn, certain kinds of materials rub against each other, and when electricity flows through wire.

Recognize the type of energy produced by three specified processes.

A misidentified the energy type that is generated by the three specified processes

B correctly recognized that the three specified processes generate heat energy

C misidentified the energy type that is generated by the three specified processes

D misidentified the energy type that is generated by the three specified processes

41 (F1) P.EN.04.43: Describe how heat is produced through electricity, rubbing, and burning.

Identify the correct energy transformation in a specific situation.

A did not identify the correct energy transformation

B identified the correct energy transformation

C did not identify the correct energy transformation

D did not identify the correct energy transformation

41 (F2) P.EN.04.52: Demonstrate magnetic effects in a simple electric circuit.

Recognize the magnetic effects of an electric current by identifying how to set up an electromagnet.

A incorrectly selected a setup with a wire not connected to a power source

B correctly selected a working electromagnet

C incorrectly selected a setup with a wire not connected to a power source

D incorrectly selected a setup with a without a power source

41 (F3) P.EN.03.31: Relate sounds to their sources of vibrations (for example: a musical note produced by a vibrating guitar string, the sounds of a drum made by the vibrating drum head).

Understand how sounds are produced.

A selected a physical process that does not produce sound

B selected a physical process that does not produce sound

C selected a physical process that does not produce sound

D correctly recognized the physical process that produces a sound wave

41 (F4) P.EN.03.11: Identify light and sound as forms of energy.

Describe lightning and thunder, using the statements provided.

A selected an incorrect description of lightning and thunder as forms of the same type of energy

B selected an incorrect description of lightning and thunder as forms of the same type of energy

C correctly selected the description of lightning and thunder as forms of energy

D selected an incorrect description of lightning and thunder as forms of the same type of energy

41 (F5) P.EN.04.51: Demonstrate how electrical energy is transferred and changed through the use of a simple circuit.

Given six components used in electrical circuits, select the set of three that are needed to prepare a functional closed circuit.

A selected a set of three components that does not include a power source

B selected a set of three components that does not include material to carry the current

C correct, selected the set of three components that can form a complete functional closed circuit

D selected a set of three components that does not include material to carry the current

42 P.EN.04.12: Identify heat and electricity as forms of energy.

Recognize that heat and electricity are similar because they are forms of energy.

A incorrectly described heat and electricity as how much matter is in an object

B incorrectly described heat and electricity as anything that has mass and takes up space

C correctly described heat and electricity as similar because they can be classified as forms of energy

D incorrectly described heat and electricity as the amount of matter in a given volume

43 (F1) S.RS.04.17: Identify current problems that may be solved through the use of technology.

Describe how technology can develop solutions to environmental pollution issues related to energy production.

A incorrect, selected one type of pollution not affected and one type of pollution that would be reduced

B incorrect, selected a type of pollution that is introduced by the new technology and one type of pollution that would be reduced

C correct, selected two types of pollution that would be reduced with the development of the new technology

D incorrect, selected one type of pollution that would be introduced by the new technology and a type of pollution that would increase

43 (F2) S.RS.04.14: Use data/samples as evidence to separate fact from opinion.

Using a brief description of a research project and given a data table, identify the types of information the data provide.

A selected two correct types of information and one incorrect type of information

B correct, student identified the three types of information presented in the data table

C incorrect, indicated that the data table provided three distinct steps of the scientific inquiry process, not types of data

D selected two correct types of data information and one incorrect type of information

43 (F3) S.RS.04.17: Identify current problems that may be solved through the use of technology.

Determine whether efforts to gather data or prepare research information involved the application of technology-based methods.

A selected a technology-based effort to gather research information

B selected a technology-based effort to gather research information

C correctly identified the information gathering effort that did not involve technology

D selected a technology-based effort to prepare research information

43 (F4) S.RS.04.14: Use data/samples as evidence to separate fact from opinion.

Given a table of monthly average temperatures in Detroit, identify the statement of opinion, rather than fact, based on information in the table.

A selected a statement of fact

B selected a statement of fact

C correct, selected the opinion statement

D selected a statement of fact

43 (F5) S.RS.04.14: Use data/samples as evidence to separate fact from opinion.

Distinguish between statements of fact and opinion.

A incorrectly recognized the classification of the specified statement

B incorrectly recognized the classification of the specified statement

C correctly recognized and classified the specified statement's type

D incorrectly recognized the classification of the specified statement

44 S.IP.04.11: Make purposeful observation of the natural world using the appropriate senses.

Appropriately interpret information provided by an illustrated investigative observation.

A did not recognize the pattern of data provided by the illustrated observation

B did not recognize the pattern of data provided by the illustrated observation

C did not recognize the pattern of data provided by the illustrated observation

D correctly recognized the pattern of data provided by the illustrated observation

45 L.EC.04.21: Explain how environmental changes can produce a change in the food web.

Based on a brief description about an organism and a display of the organism within a food web, identify the most harmful threat to the organism's survival.

A selected a statement that does not reasonably threaten the organism's survival

B selected a statement that would promote the organism's survival

C selected a statement that would have no threat to the organism's survival

D correctly selected the statement where the organism's survival would be threatened by a specific environmental change

46 L.EV.03.12: Relate characteristics and functions of observable body parts to the ability of animals to live in their environment (sharp teeth, claws, color, body coverings).

Given a specified animal characteristic, recognize the survival value this characteristic has for the animal.

A selected a survival value that is not a function of the characteristic

B selected a survival value that is not a function of the characteristic

C correct, selected the survival value the animal has from this characteristic

D selected a species survival value not related to this animal characteristic

47 (F1) L.EV.04.21: Identify individual differences (color, leg length, size, wing size, leaf shape) in organisms of the same kind.

Recognize which characteristic is best used to determine young to parent.

A selected a characteristic that does not associate young to parent

B selected a characteristic that does not associate young to parent

C selected a characteristic that does not associate young to parent

D selected the characteristic used to identify young and parent

47 (F2) L.EV.03.11: Relate characteristics and functions of observable parts in a variety of plants that allow them to live in their environment (leaf shape, thorns, odor, color).

Recognize the plant characteristic that is adaptive for survival in a specified environment.

A selected a plant characteristic that is not adaptive for survival in the specified environment

B selected a plant characteristic that is not adaptive for survival in the specified environment

C correctly selected the plant characteristic best adaptive for plant survival in the specified environment

D selected a plant characteristic that is not adaptive for survival in the specified environment

47 (F3) L.EV.04.22: Identify how variations in physical characteristics of individual organisms give them an advantage for survival and reproduction.

Recognized that differences in observed body features across different types of animals within the same species relate to unique survival advantage in its environment.

A recognized that the different characteristics between the two animals of the same body part relate to survival advantage (camouflage) specific to each animal's environment

B selected a distinction between the animals that does not necessarily relate to the differences in the specified body feature

C selected a distinction between the animals that does not necessarily relate to the differences in the specified body feature

D selected a true effect regarding the difference between the animal's similar body part; however, this effect is not related to the animal's survival in its unique environment

47 (F4) L.EV.03.11: Relate characteristics and functions of observable parts in a variety of plants that allow them to live in their environment (leaf shape, thorns, odor, color).

Describe the function of thorns as a plant adaptation used for survival.

A selected the function of flowers

B correct, selected a likely function of thorns on plants

C selected a function that would not help a plant survive

D selected a function of a stem or tendrils

47 (F5) L.EV.04.21: Identify individual differences (color, leg length, size, wing size, leaf shape) in organisms of the same kind.

Recognize which characteristic is best used to determine young to parent.

A selected a characteristic that does not associate young to parent

B selected a characteristic that does not associate young to parent

C selected a characteristic that does not associate young to parent

D selected the characteristic used to identify young and parent

48 **L.HE.02.13:** Identify characteristics of plants (for example: leaf shape, flower type, color, size) that are passed on from parents to young.

Based on details in a provided investigation procedure, select the investigation measure that provides information about inherited plant characteristics

A selected an investigation resource unrelated to inherited plant characteristics

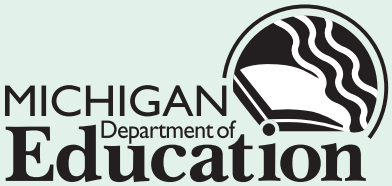
B correctly selected the measure that provided information about inherited characteristics

C incorrectly selected a investigation condition unrelated to a measure that provides information about inherited characteristics

D selected an investigation resource unrelated to inherited plant characteristics

5th

8th



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